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AGRICULTURAL PROGRESS.

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DRAINAGE.

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## AGRICULTURAL PROGRESS.

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### DRAINAGE.

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AT a time when almost every nation is competing in the race to secure bread-food, and when prices of corn are excessively high, it may not be unprofitable to glance at some of the means by which the food-produce of England may be increased.

The subject may seem unimportant to many, as it may be reasonably inferred, from the fact of this country being dependent on foreign supplies to the extent of nearly one-third of its entire consumption, that its agricultural resources are developed to their utmost limits. While the premises are true, the inference is groundless. The actual condition of English agriculture reveals a widely different state of matters. In the northern counties of England, in Devonshire, and in Wales, there are at least 2,000,000 of acres of mountain land now almost valueless, but which, at a comparatively trifling cost, could be made to yield rich pastures. A very large breadth of moor and forest land contributes almost nothing



for the support of man ; while, in not a few districts, one-fifth of the total area is occupied by superfluous and irregular fences.

The evil of not rendering such vast resources profitable is magnified by the fact of the increase of the means of subsistence not keeping pace with the increase of population. The increasing disparity between consumption and production, indeed, imparts to the subject a grave feature, as it anticipates higher prices, and an increasing dependence on foreign aid.

Taking the increase of population at the same ratio now as it was from 1851 to 1861, the number of persons annually added to the population is about 240,000. To meet the wants of this increase of population, and estimating the average expenditure of each individual for bread-food, potatoes, and butcher's meat to be £10 per annum, an annual increase of food-produce to the value of £2,400,000 is required. To what extent our native powers of production may be developed to meet this increasing consumption I do not now inquire ; but, as the heading of this communication indicates, will shortly notice what may be done in England—without reference to Scotland—by the drainage of the cultivated area—arable, meadow, and improved pasture—alone.

But for the evidence of the fact itself, it would not be credited that one-fifth of the cultivated area is still undrained. Cheshire, with its red marl soil—rich in quality and of great surface depth, is not more than half drained ; Durham, with

its moorish surface-soil and carboniferous subsoil, has one-third of its produce injured by stagnant water ; one-half of Middlesex, although situate under the shadow of the Metropolis, yields, for the want of draining and liming to reduce its stubborn soil, only hay for cattle. The extensive breadth of land which stretches from Seven Oaks Weald to Reigate on the one side, and to Tunbridge Wells on the other, is, on account of its heavy labour expenditure, from neglected drainage, scarcely worth cultivating ; while in every county—especially in Wilts, Dorset, Somerset, Essex, Suffolk, Worcester, York, and Lancashire—there are extensive tracts of stagnant-water-poisoned land.

As drainage is the basis of all agricultural improvements, so there are usually associated with undrained estates the cognate evils of bad tillage, inefficient manuring, small fields, irregular fences—which not only occupy one-fifth of the total area, but also harbour vermin, shade crops, and extract nourishment from the surrounding soil—inferior road accommodation, dilapidated buildings, and, in short, land whose resources are not half developed.

The fact of there being such an extensive undrained area might go far to strengthen the opinion that the results of drainage have proved inadequate to the outlay, or that land-owners have formidable difficulties to overcome in the draining of their estates.

With respect to the first averment, outlay on efficient drainage has proved to be not only the most secure, but

also one of the most profitable investments. It generally yields from 12 to 20 per cent. In not a few instances I have known the total cost repaid by the first crop, and I do not know of a single case of efficiently-executed drainage, under proper subsequent management, having proved unsuccessful.

I have said, under proper subsequent management, as it must be admitted, that there are farmers, who, by supposing that drained land can be tilled at all times, plough it into a sort of mortar, and continue the absurd practice of ploughing with four horses "a-head," and thus, by making them all tread over the same furrow bed, form a puddled stratum, impervious to roots, air, or water, which neutralises the effects of drainage. Happily the steam cultivator will remedy this evil, and, so far from being a barrier, will prove a powerful auxiliary to drainage.

As a rule, drainage executed by farmers is unsuccessful ; and in nine cases out of ten, where landowners contribute pipes, and tenants labour, both labour and material are thrown away. I do not advance this as disparaging to farmers, as they have not time to give drainage that supervision which the securing of proper outfalls and levels, as well as the necessary depths and distances apart of drains, require. I may add, that, from a mistaken economy in placing drains too widely apart, a large breadth of land, that was drained several years ago, requires to be partially re-drained. These instances, however, of unsuccessful results

only prove defective execution, and furnish no valid arguments against drainage.

As to landlords' difficulties in executing drainage, there are virtually none. Financial companies advance money to any amount at a moderate rate of interest ; and, as a rule (I admit there are exceptions), drainage under Government inspection is a guarantee for efficient execution. True, in not a few instances, farmers object to having no control over the drainage of their farms, and do not like to pay interest on drainage equivalent to an increase of rental of 6*s.* or 7*s.* per acre. Landowners, however, have the power to drain in their own hands, and beneficial it is to the interest of themselves and their tenants when they exercise it. It is, however, only fair to tenant farmers to state that many of them are equally anxious with their landlords to have their farms drained on a proper system, as I have found in the draining of the extensive estates of the Earl of Shrewsbury, the Marquis of Downshire, and Admiral Warde, where the tenants not only readily agreed to pay the interest on the outlay, but in every way facilitated the progress of the works. Owners and occupiers, indeed, reap equally satisfactory returns from drainage, the former getting their estates permanently improved without expending one shilling of their own ; the latter, by paying seven per cent. interest per annum, realising in lieu 15 per cent. value.

To revert to the undrained area. Computing the same to be one-fifth of the cultivated area, as above stated, there

are nearly 5,000,000 of acres that require close drainage, the cost of which, at £6 per acre, would involve an outlay of £30,000,000. Assuming that that outlay was expended, and estimating the returns therefrom at 15 per cent. per annum, the value of the increase of produce accruing therefrom would amount to £4,500,000.

Considering such vast returns from drainage, embraced in lighter tillage labour, less seed, larger crops, the substitution of roots for naked fallows, of sheep husbandry for exclusive corn cropping ; in the utilising of rain-water, which formerly only denuded the soil of plant food ; the ploughing of land level instead of into ridges, a greater depth of available soil, reformed pastures, and earlier crops, it is truly surprising that there is so large an area to drain, and notwithstanding drainage progresses so slowly.

Since the Government loan, which gave the first impulse to drainage, was taken up, financial companies have greatly facilitated the execution of drainage works. During the last ten years the Lands Improvement Company has advanced loans on drainage in England to about £1,500,000. Estimating that the half of that sum has been advanced by all other financial companies and landlords together, the extent of land annually drained in England, computing the cost as above at £6 per acre, is only 37,500 acres. Progressing, therefore, only at the present rate, it will take 133 years to complete the drainage of wet land.

The profitable results obtained from drainage expenditure

furnish sufficient grounds for imparting a fresh and vigorous impulse to the draining of land. The present indeed is a most suitable time, as money is so abundant that it can scarcely find employment, while, from the almost total cessation in the constructing of railroads, labourers were never more plentiful.

Adding to the undrained area above referred to, the extensive breadth of undrained land in Scotland and Ireland, the large reclaimable mountain area, the wide tracts of convertible forest and moor land, and the very large area reclaimable from the sea, and from the straitening and embanking of rivers, we see that the undeveloped food resources of Great Britain are still vast, and tend in no small degree to brighten future prospects.













